WEATHER, FORECASTS, AND WARNINGS FOR THE MONTH.

By EDWARD H. BOWIE, District Forecaster.

The month as a whole was unusually cold and was marked by decided temperature changes. Records in a few cities were broken as regards lowest temperatures ever recorded in the month of January, and at a number of points the record for continued low temperatures was broken. At Duluth, Minn., the average temperature for the first 12 days of the month was 19° below zero, breaking all records for continuous low temperatures at that station. Snows in the Northwest, together with the extreme cold, caused more serious delays in mail schedules than have been experienced in years. Over the transatlantic steamer routes the month was unusually stormy.

Honolulu.—Pressure for the month was characterized by marked fluctuations, and from the 18th to 24th was continuously below the seasonal average. Lows occurred on the 4th–5th, 9th, 13th, 18th–24th, and on the last day of the month. Highs occurred on the 1st–2d, 7th, 11th, 15th, and 26th.

Alaska.—Pressure averaged above during the first decade, while during the remainder of the month it was below normal. Lows occurred about the 2d–3d, 9th, 14th, 17th–18th, 21st, 23d, 25th–26th, and 29th–30th; and highs on the 1st, 3d–8th, 12th, 16th, 20th, 22d, 24th–25th, and 28th. A storm that occurred on the 15th and 16th over the Aleutian Islands broke the mast of the Navy wireless station at Dutch Harbor, Unalaska, and from that time no reports were received from this station up to the end of the month.

Azores.—Lows occurred on the 1st, 7th, 9th, 11th–12th, 14th–15th, 18th, 23d, 26th, and 31st; and highs on the 3d–5th, 10th–11th, 12th–13th, 16th–17th, 19th–20th, 21st, 24th, and 28th. The lowest pressure of the month, 29.04 inches, was recorded during the afternoon of the 31st, and is the lowest reported since December, 1909. The low of the 14th–15th passed over England on the 16th and over France on the 17th–18th, causing gales over the western coasts of Europe, the British Isles, and the western Mediterranean Sea, and numerous wrecks over those regions. A blizzard is reported to have occurred in the northern portion of the British Isles, completely delaying all traffic, and schools were closed on account of the severity of the cold. A severe storm occurred over France during the 7th and 8th. The month as a whole over the British Isles was stormy and at the end of the month floods threatened in parts of England.

Iceland.—Pressure averaged above normal throughout the month. Lows occurred on the 11th, 13th, 16th, 22d–23d, and 31st; and highs on the 4th, 7th–8th, 10th, 18th, 25th–26th, and 28th. The high pressure over Iceland and the low pressure to the southward caused almost continuous rains over France from the 5th to 11th, resulting in a marked rise in the Seine, but no damage resulted, although it was thought for a time that there would be a repetition of the 1910 floods.

Siberia.—Pressure was generally low during the first and third decades of the month and abnormally high during the second. Lows occurred about the 2d, 4th, 6th–7th, 9th–10th, 18th, 21st, 25th, and 30th, and highs about the 8th, 13th, 16th, 23d, and 27th.

In the United States the month opened with temperatures above normal in Atlantic coast districts, while elsewhere throughout the country they were below the seasonal average. In the Plains States temperatures were 20° or more below the seasonal average, while in eastern and southern Colorado the most protracted cold spell in years was in progress.

At the beginning of the month a low was central over New Brunswick, with a trough extending southward to Hatteras. Another low-pressure area of slight intensity was central over northern California, causing precipitation in that State and in Nevada, while another low was over the southern slope of the Rocky Mountains. A high pressure area was central over the middle Mississippi Valley and another over British Columbia.

The high that was central in the middle Mississippi Valley advanced, by the morning of the 2d, to the middle Atlantic coast with diminished intensity and by the following day had passed northeastward and was central over the Canadian Maritime Provinces.

The southern slope low moved to the west Gulf coast by the morning of the 2d, and on the morning following was south of Alabama. By the morning of the 4th it had passed northeastward to a position off the middle Atlantic coast. This low was attended by rains in the States bordering on the Gulf and in the south Atlantic States.

A high appeared over British Columbia on the evening of the 2d, and advanced southward over the Sierra Nevada. Frost warnings were issued for California on the 2d and were fully verified during the early morning of the 3d. They were repeated for several mornings following in that State until the high over Nevada, which had remained practically stationary since the 3d, began to diminish on the 6th. Cold-wave warnings were ordered during the 2d for Wyoming and western South Dakota and changes to much colder weather occurred as indicated in the warnings.

A low appeared over Alberta on the evening of the 2d and by the following morning was over Manitoba. By the morning of the 4th it has moved to western Ontario. On the morning of the 5th there was a disturbance off the New England coast, probably a combination of the storm above mentioned and the one that was off the middle Atlantic coast on the morning of the 4th. It moved thence northeastward to the Grand Banks with considerably increased intensity, the lowest pressure reported on the morning of the 6th being 28.98 inches at St. Johns, Newfoundland. Gales prevailed in connection with this storm from Hatteras to Eastport, warnings of which were issued in advance of their occurrence, and precipitation occurred throughout the Lake region and in the Atlantic States.

Following the passage of this low, a high-pressure area, that apparently developed over the northern slope of the Rocky Mountains during the first two days of the month, advanced southeastward to Oklahoma by the evening of the 3d, attended by decided falls in temperature over that region, warnings of which had been previously issued.

The following editorial from the Daily Eagle of Wichita, Kans., dated January 3, 1912, refers to these warnings, and, in commenting on the condition of the cattle on the ranges during the winter season and the means used to protect and feed them, says:

> Fully 48 hours in advance of the recent storm the Weather Bureau called the turn neatly on the cold wave and snow and scattered warnings throughout the Southwest of the importance of preparing for a cold wave.

The high remained stationary for about 24 hours and was augmented by another that appeared the evening of the 4th over Saskatchewan, and cold-wave warnings were

issued the evening of the 4th for Atlantic States north of Virginia. On the morning of the 5th there was a single center of high pressure over the Dakotas of greatly increased intensity, minimum temperatures ranging from 20° to 30° below zero being reported from that region. By the morning of the 6th the center was over West Virginia, and by the following morning it had divided and passed off the coast, one center being north of Bermuda and the other over Maine. It was accompanied by decided changes to colder weather throughout all districts east of the Rocky Mountains. In connection with this high the lowest temperatures experienced in several years were reported from the upper Mississippi Valley and the Upper Lake Region. The severe cold caused a number of deaths and much suffering in districts from the Plains States eastward to the Atlantic coast.

Gales occurred in connection with a storm that passed inland from the north Pacific Ocean during the 4th, warnings of which were issued in advance of the high winds. On the morning of the 5th the storm was central over the northern plateau; thence it advanced rapidly southeastward, and by the morning of the 6th was over the West Gulf States. On the 6th heavy snow warnings were issued for the Ohio Valley and snow occurred as forecast; while gales occurred on the Texas coast, for which warnings were issued well in advance. By the morning of the 7th the disturbance had passed to the Atlantic seaboard, having caused rains and snows, the latter being heavy in Oklahoma and neighboring States throughout its course from the north Pacific coast to the West Gulf States and also in the territory from the Mississippi River eastward.

Following this low, a high of considerable magnitude appeared over Saskatchewan on the morning of the 5th, and cold-wave warnings were issued on that date for Montana, Wyoming, and Colorado. By the morning of the 6th the high had moved southward to Montana, and during the day cold-wave warnings were ordered for New Mexico and later extended eastward to the Ohio Valley and southward to the Gulf States. On the morning of the 7th the high was over the Middle Mississippi Valley, with temperatures more than 40° below normal near its center, the coldest weather in years being reported in central Illinois. It passed rapidly northeastward and by the following morning was central over New England. Trains in the Middle West had great difficulty in maintaining schedules on account of the snow and the extreme cold. Marked changes to colder weather attended the passage of this high across the country, and heavy ice formed along the coasts of Massachusetts and Rhode Island.

The following is an editorial from the Democrat of Little Rock, Ark., dated January 8, 1912:

Due to the advance notice of the exceptional cold wave, there was little suffering among the live stock of the State, the planters and stock owners taking precautions against the cold in the keeping of their stock.

Also the following from the Democrat, of Vicksburg, Miss., dated January 8, 1912, regarding the warnings issued in connection with the cold wave:

The splendid forecasts of the national department in Washington have enabled the suffering public to meet the onrushes of the cold spell with more than ordinary precaution, and the losses have been minimized.

The following editorial appeared in the Globe-Democrat, of St. Louis, Mo., January 8, 1912:

Two weeks ago the Government Signal Service [Weather Bureau] reported the appearance of a cold wave of unusual severity in Alaska and gave due notice that the temperature of 52° below zero meant exceptionally cold weather for the rest of the country later on. It has arrived, and the winter record for several years is broken by a margin that will not be questioned. It is not necessary yet to chop alcohol for mechanical purposes, but stokers are kept busy, and the scrunch of the shovel at the rapidly diminishing coal pile reminds the householder that the weather reports, long range and other, are well worth examining. Mild and sunny December days were with us then, and it seemed absurd, even with the warning sounded, to take a precautionary view of the coal pile. * * * It is a good time to acknowledge the faithful service and scientific progress of the Government Weather Bureau.

The following weekly forecast was issued January 7:

The indications are that the coming week will be marked by a continuation of unseasonably cold weather and marked storm activity over practically all parts of the country. A general reaction to warmer weather is probable, however, the latter part of the week in the western districts and at the close of the week in the Eastern and Southern States.

The first general storm of the week to cross the country is now central over Utah, whence it will move eastward and cross the great central valleys Monday night or Tuesday, and the Eastern States Tuesday or Tuesday night; it will be preceded by moderating temperature, and rain and snow in southern, and snow in northern districts, and be followed by a widespread change to colder weather. This cold wave will appear in the Northwest Monday night.

The next general disturbance to cross the country will appear on the Pacific coast Wednesday, cross the Middle West about Friday, and the Eastern States at the close of the week; it will be attended by widespread cloudiness and precipitation and a general reaction to warmer weather.

Stormy weather will prevail the coming week over the North Atlantic steamship routes, the British Isles, and Europe.

By the morning of the 7th a low passed from the north Pacific coast to northern Utah, and by the evening of that date was over Colorado, while a high-pressure area was central over the State of Washington, and another low had appeared over Saskatchewan. One of the heaviest snows of record occurred throughout Idaho, Montana, and Eastern Oregon, and consequent delays to railway traffic were reported. Destructive sleet storms also occurred in parts of Oregon. During the 8th temperatures rose decidedly from the Rocky Mountains eastward, although still below the normal. By the morning of the 8th low centers were over Manitoba and Oklahoma, and by the evening of that date they had advanced rapidly eastward, one being central over Lake Huron and the other near Hatteras. Storm winds occurred over the Gulf coast and along the Atlantic seaboard for which warnings were issued previously to their arrival. By the morning of the 9th there was but one center of low pressure, and that was central over the State of Maine, with the lowest barometric pressure, 28.86 inches, at Portland and Greenville. The storm advanced northward during the next 12 hours, and pressure decreased to 28.58 inches at Father Point, in the Province of Quebec. The storm by the morning of the 11th was over the Grand Banks, accompanied by severe gales from Hatteras northward, warnings of which had been previously issued. Heavy snows occurred in connection with these storms over Missouri, Oklahoma, Kansas, Arkansas, Nebraska, and Iowa, and precipitation was quite general in the States from the Rocky Mountains to the Atlantic coast. The high winds that prevailed over the Lower Lakes on the 9th and 10th drifted snow so as to considerably impede railroad traffic.

Following the passage of these lows, the high-pressure area that was over British Columbia on the morning of the 7th advanced eastward during the next 24 hours to Idaho, with a tongue of high pressure extending southeastward, causing some of the lowest temperatures of record in the northern plateau. During the 7th cold-wave warnings were issued for Montana, Colorado, Utah, Arizona, and New Mexico, and freezing-temperature warnings for Gulf sections. By the morning of the 9th, the high was over eastern Texas and another high had appeared over Alberta. By the morning of the 10th the southern high had advanced to Georgia and the northern high had remained practically stationary, temperatures being from 20° to 45° below the seasonal average over

Central and Northern States east of the Rockies, causing considerable delay to trains in the northern Plains States. By the morning of the 11th the southern high had passed off into the ocean and the northern high was central over North Dakota. In the northern Plains States, a number of mercurial thermometers broke on account of the extreme cold, and Chicago, among a number of other cities, experienced its longest and one of the coldest periods of weather in its history. In western Canada, near Lesser Slave Lake, a temperature of 51° below zero was reported.

On the morning of the 9th a low-pressure area appeared on the north Pacific coast. Storm warnings were issued for that region the previous day, and storm winds occurred as forecast. The low by the following morning was central over northwestern Wyoming and by the morning of the 11th was over Texas. Precipitation occurred quite generally over the Rocky Mountains and thence westward, except in the southern plateau. The heaviest snowstorm in years occurred in the Coeur d'Alene Mountains, and cattle were reported starving in eastern Colorado and Wyoming. Snow slides delayed traffic in portions of Idaho and Montana. On the 11th storm warnings were issued for the northern California coast, and high winds occurred as forecast. The low passed across the Gulf States and by the morning of the 12th a center of low pressure was south of Hatteras and another over the eastern Gulf of Mexico. The northern low passed rapidly northeastward, while the one to the south was over southern Florida on the evening of the 12th. On that date storm warnings were issued for the Atlantic coast from Jacksonville to Hatteras and high winds occurred over that region during the next 24 hours, causing considerable damage to shipping. By the morning of the 14th the storm had passed northward into the ocean and by the morning of the 15th it was south of Nantucket with greatly increasing intensity. Gales occurred on the New England coast, warnings of which were previously issued. Precipitation occurred in connection with this storm quite generally throughout the entire country. Heavy snows occurred in portions of the south Atlantic and in the northern portions of the East Gulf States and in the lower Ohio and middle Mississippi Valleys. Railway traffic was delayed almost everywhere throughout the country east of the Rocky Mountains, except in the extreme South. Charleston, S. C., reported the heaviest sleet storm in years.

The following editorials in connection with the storm and cold wave are of interest:

New York Times, January 14, 1912:

* * * Incidentally the Weather Bureau deserves a word or two of praise for its accurate forecasts of weather conditions lately. By and large this service is of immense value to the country. Along the coast we are apt to blame it because sudden unpredicted showers frequently belie its promise of dry and sunny days. But showers are local disturbances, and when there is real weather to be dealt with the bureau is unquestionably efficient.

The Pittsburgh Post, January 14, 1912:

The cold wave has vindicated the weather officials, who sounded a warning of the drop in temperature nearly 48 hours in advance of its arrival. Severe as is the visitation, all credit must be given the service for the timely notification that enabled shippers and others to take steps that resulted in the saving of many thousands of dollars' worth of perishable merchandise. We are too prone to ridicule the Weather Bureau. There are those who poke fun at the occasional failure of a prediction, but they are seldom fair enough to give credit for the numerous "hittings of the mark" that result in a direct saving to the people. The Weather Bureau conducts its work along scientific lines, and in a large percentage of instances justifies its precautionary announcements. The weather may be fickle, and in some cases baffle the observers, but as a rule a distinct change like the most recent cold wave is based on data that are borne out to the financial gain as well as the comfort of the people.

The Times, Scranton, Pa., January 15, 1912:

* * * And, while we are on the weather subject, the Weather Bureau, general and local, deserves a word of praise for accurate forecast of weather conditions during last week's weather spell. The service in many ways, to varied industries and to the public in general, is of immense value. We are apt to blame the weather man as being inaccurate because of sudden or unpredicted storms or local disturbances, but when there is a well-defined "low" or "high" area the bureau is unquestionably efficient.

The following weekly forecast was issued Sunday, January 14:

No severe cold wave will cross the country during the coming week. The general pressure distribution as shown by the weather map of the Northern Hemisphere during the last several days is such as to indicate a general reaction to normal temperature conditions over the eastern half of the country by the middle of the week and to temperature above the seasonal average in western districts throughout the week.

The week will be one of generally fair weather east of the Rocky Mountains, except that a short period of rains in Southern and snows in Northern States will attend a disturbance which will appear in the Northwest Tuesday, cross the Middle West Wednesday or Thursday, and the Eastern States about Friday. Precipitation will be above the normal in the North Pacific States.

A low appeared over British Columbia on the morning of the 12th and moved to western North Dakota the following morning. On the 14th it was over the Upper Lakes. By the morning of the 15th it was over Lake Ontario, while the low previously mentioned was south of Nantucket. Gales occurred until the 17th, from Nantucket to the Grand Banks and warnings were distributed well in advance of their occurrence. By the morning of the 16th there was but one center over Maine and by the following morning it had advanced to the Grand Banks. This storm caused precipitation generally from the Mississippi Valley eastward. At Chicago telegraph and telephone service was for a time demoralized. In Newfoundland the worst blizzard known in recent years in that region occurred, causing suspension of traffic and demoralization of telegraph service.

The high that was over the Dakotas on the morning of the 11th advanced to the upper Mississippi Valley by the following morning and by the morning of the 13th was over the Lower Lakes. It passed thence northeastward to Maine by the following morning. This high was accompanied by a rapid and widespread change to colder weather over all the country east of the Rocky Mountains, particularly in the Gulf States. At a number of stations the coldest weather for a number of years was experienced, and at a few points it was the coldest in 40 years. The Hudson River was frozen over as far south as Yonkers for the first time in 20 years.

A high appeared over Saskatchewan on the morning of the 14th, accompanied by decided changes to colder weather, and by the next day had advanced to the Plains States. It was central over western Tennessee on the 16th, causing killing frosts to the east and central Gulf coasts and in the interior of northern and central Florida. By the morning of the 17th it was over eastern North Carolina and during the next 24 hours passed eastward to the ocean.

The following editorial is taken from the Courier-Post of Hannibal, Mo., dated January 16, 1912:

The Government Weather Bureau has done itself proud this winter. We must concede this, even if we don't like the brand of weather served up. Warning has been given in advance of every cold wave, giving us time to brace ourselves before it hit us. * * *

The following editorial is taken from the Charlotte, N. C., Evening Chronicle, of January 16, 1912:

The warnings issued yesterday from Washington were characterized by great accuracy. Colder was the forecast for the entire State of North Carolina, but a technical cold wave was predicted for the vicinity of Asheville only. And that is the only place in the State or its vicinity that secured the necessary degree of cold to technically verify such a warning. * * *

A low-pressure area appeared over Alberta on the evening of the 15th and by the following morning there were two centers—one over northwestern North Dakota and another over western Nebraska. The northern low passed eastward to western Lake Superior by the following morning and thence northeastward into Canada. The Nebraska low passed southeastward to the west Gulf by the morning of the 18th and another low was central over the Michigan peninsula, with a trough to the southwestward. The Michigan low moved northeastward to Quebec by the following morning, while the west Gulf low passed up the Ohio Valley in the trough of the first-mentioned low, and thence disappeared. The Quebec low passed northeastward to the Canadian Maritime Provinces by the morning of the 20th. In its passage across the country this storm was accompanied by decided changes in temperature from the Rocky Mountains eastward to the Atlantic coast and by well-distributed precipitation from the Mississippi Valley eastward. In connection with this storm a tornado occurred on the 19th, near Winona, Miss., causing considerable damage and the loss of several lives. Gales occurred from New York northward on the Atlantic coast, warnings of which had been previously issued. Transatlantic shipping experienced considerable difficulty with the rough weather accompanying the disturbance.

Following this disturbance, a high-pressure area appeared over Saskatchewan on the morning of the 18th, and passed to the Missouri Valley by the 19th. By the morning of the 20th it was over West Virginia. This high was accompanied by temperature changes ranging from 20° to 30° or more over all the district east of the Rocky Mountains.

The next low advanced along the northern border from the 20th to the 22d. It caused no precipitation of consequence and temperatures rose decidedly throughout the country attending its passage.

On the 20th a high-pressure area developed over the eastern slope of the Rocky Mountains and by the 21st it was over the west Gulf States and by the next morning was over the eastern Gulf.

The following weekly forecast was issued January 21:

Temperatures during the coming week will average near or above the normal throughout the country, and there is nothing at the present time to indicate that a general cold wave will cross the country.

Generally fair weather will prevail east of the Rocky Mountains, except that a short period of rains and snows will attend a disturbance that will appear in the far West Tuesday or Wednesday, cross the Middle West about Thursday and the Atlantic States Friday or Saturday.

There are indications that general rains will set in over the Pacific States by the middle of the week and continue several days.

Moderate weather and wind conditions will prevail over the North Atlantic steamship routes during the coming week.

A low appeared over Saskatchewan on the morning of the 21st, and by the following morning it was over Manitoba. It had advanced to western New York by the morning of the 23d and during the next 24 hours passed to the Grand Banks. The precipitation in connection with this low was very light and was confined to northern districts.

Pressure had fallen on the north Pacific coast on the morning of the 24th, and by the following morning a low was over southern Alberta, with an extension into western South Dakota. Pressure was relatively low over the middle slope of the Rocky Mountains on the 24th, and conditions remained unsettled over that region until the 26th. By that morning there were two low centers, one over western Kentucky and another over Iowa, and a high-pressure area had appeared over Manitoba. By the morning of the 27th the high had advanced to Minnesota, and there was a low pressure area off the southern New England coast, while a secondary was central over North Carolina. Temperatures were above normal generally in the South and West and below normal in Northern States from the Plains States eastward and in the Middle Atlantic and New England States. By the morning of the 28th there was a storm over Newfoundland of great severity, with pressure reading at St. Johns 28.74 inches. Attending the passage of this disturbance, precipitation occurred in the north Pacific States and in the Lake Region and the Atlantic States from Virginia northward.

The high-pressure area that was over Minnesota on the 27th advanced to Lake Ontario by the morning of the 28th, with slightly increased intensity, and was accompanied by temperatures decidedly below normal, a temperature of 50° below zero being reported at Lake Desolation in the Adirondacks. By the morning of the 29th there were two centers of high pressure—one over Maine and another over Bermuda.

A low-pressure area that appeared over the north Pacific coast on the morning of the 26th advanced to Colorado by the following morning. It passed thence to the west Gulf States by the morning of the 28th, there being two centers—one over Missouri and the other over southern Texas.

The following weekly forecast was issued Sunday, January 28:

A marked rise in temperature will overspread the Eastern States during Monday and moderate temperatures will prevail thereafter over the eastern half of the country the greater part of the coming week. Over the Middle West, the Northwest, and on the Pacific slope normal temperatures will prevail until near the close of the week, when a change to decidedly lower temperatures will overspread these regions. This cold wave will appear in the Northwestern States Friday or Saturday, whence it will advance eastward and southward over practically all districts east of the Rocky Mountains.

A disturbance that now covers the Southwest will advance to the Eastern States Monday and be attended by snows in Northern and rains in Middle and Southern States east of the Mississippi Valley.

The next general storm to cross the country will appear in the far West Tuesday or Wednesday, cross the Middle West about Thursday or Friday, and the Eastern States near the close of the week. It will be attended by general snows in northern and rains in southern districts. Frequent rains are probable the coming week in the Pacific States.

By the morning of the 29th the Missouri low had advanced to Ohio, while the southern Texas low was over Alabama. By the following morning there was a cyclonic circulation over eastern Ontario, while the main center of low pressure was central at St. Johns, Newfoundland, pressure reading 29.10 inches, with a trough extending southwestward to the south Atlantic coast. On the morning of the 31st a low that developed in this trough was central off Nantucket, while the Newfoundland disturbance had passed rapidly eastward over the steamship routes, as indicated by the pressure reading that morning at Horta, in the Azores, 29.16 inches. Precipitation occurred quite generally in connection with this storm from the eastern slope of the Rocky Mountains to the Atlantic coast.

During the 27th an extension of the ocean high made its appearance on the northern California coast and by the following morning showed as an inclosed isobar over western Nevada. It remained stationary over the middle Plateau region until the last day of the month, when it appeared with greatly increased intensity over Idaho. In the meantime a high area apparently developed over the northern slope of the Rocky Mountains on the 29th, and by the morning of the 30th had moved to the southern Plains States and by the following morning to the Gulf coast, causing frosts in the east Gulf States.

A low appeared over Saskatchewan on the morning of the 30th, and by the following morning was over Minnesota, with decreased intensity.

The month closed with temperatures below normal east of the ninety-fifth meridian, except in New England, while to the westward they were above, except in the southern plateau and in Texas.

An editorial from the New York City Review, dated February 1, 1912, regarding the warnings of the bureau in January, 1912, follows:

* * * The Weather Bureau rendered valuable service in forecasting the advance and recession of cold waves and in sending timely warnings of severe gales along our coasts.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for current month.	Departures for current month.
New England	12	17.8	− 6.7
Middle Atlantic	15	24.1	− 7.2
South Atlantic	10	41.1	− 4.1
Florida Peninsula *	9	59.4	− 0.1
East Gulf	11	43.8	− 3.5
West Gulf	10	41.6	− 3.8
Ohio Valley and Tennessee	13	25.4	− 8.1
Lower Lakes	10	14.3	− 9.8
Upper Lakes	12	4.3	−13.6
North Dakota *	9	− 6.1	−10.5
Upper Mississippi Valley	14	8.8	−12.8
Missouri Valley	11	13.0	− 8.7
Northern slope	9	17.8	− 1.2
Middle slope	6	24.2	− 4.9
Southern slope *	8	35.8	− 4.4
Southern Plateau *	10	41.3	+ 1.0
Middle Plateau *	10	27.2	+ 2.7
Northern Plateau *	11	27.3	− 1.3
North Pacific	7	42.6	+ 3.2
Middle Pacific	5	49.3	+ 2.1
South Pacific	4	54.7	+ 3.8

* Regular Weather Bureau and selected cooperative stations.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departures, current month.
		Current month.	Percentage of normal.	
New England	11	3.09	89	−0.4
Middle Atlantic	15	2.39	75	−0.8
South Atlantic	11	3.70	95	−0.2
Florida Peninsula *	9	5.99	215	+3.2
East Gulf	11	5.45	108	+0.4
West Gulf	10	1.20	40	−1.8
Ohio Valley and Tennessee	14	2.67	69	−1.2
Lower Lakes	10	2.65	100	0.0
Upper Lakes	13	1.14	58	−0.8
North Dakota *	9	0.33	52	−0.3
Upper Mississippi Valley	15	0.80	47	−0.9
Missouri Valley	11	0.43	42	−0.6
Northern slope	9	0.71	78	−0.2
Middle slope	6	0.12	17	−0.6
Southern slope *	8	0.02	2	−0.9
Southern Plateau *	10	0.01	1	−0.9
Middle Plateau *	11	0.37	35	−0.7
Northern Plateau *	11	1.95	118	+0.3
North Pacific	7	7.58	113	+0.9
Middle Pacific	7	3.68	79	−1.0
South Pacific	4	1.06	38	−1.7

* Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departure from the normal.

Districts.	Average.	Departure from normal.	Districts.	Average.	Departure from normal.
New England	73	−3	Missouri Valley	83	+8
Middle Atlantic	73	−3	Northern slope	77	+7
South Atlantic	74	−3	Middle slope	73	+6
Florida Peninsula	86	+5	Southern slope	62	−4
East Gulf	74	−4	Southern Plateau	48	−2
West Gulf	72	−4	Middle Plateau	68	−2
Ohio Valley and Tennessee	75	−2	Northern Plateau	83	+3
Lower Lakes	79	−2	North Pacific	87	+2
Upper Lakes	84	+1	Middle Pacific	84	+3
North Dakota	88	+8	South Pacific	70	−2
Upper Mississippi Valley	81	+3			

Average cloudiness and departure from the normal.

Districts.	Average.	Departure from normal.	Districts.	Average.	Departure from normal.
New England	6.2	+0.3	Missouri Valley	5.1	+0.1
Middle Atlantic	6.3	+0.5	Northern slope	6.0	+0.9
South Atlantic	6.0	+0.7	Middle slope	4.2	+0.1
Florida Peninsula	5.9	+1.1	Southern slope	4.1	−0.3
East Gulf	5.9	+0.2	Southern Plateau	2.6	−0.8
West Gulf	5.2	−0.1	Middle Plateau	5.3	+0.2
Ohio Valley and Tennessee	6.2	−0.2	Northern Plateau	8.0	+1.3
Lower Lakes	7.4	0.0	North Pacific	7.9	+0.4
Upper Lakes	6.4	−0.5	Middle Pacific	6.7	+1.1
North Dakota	5.9	+1.0	South Pacific	4.7	+0.2
Upper Mississippi Valley	5.4	0.0			

Maximum wind velocities.

Station.	Date.	Velocity.	Direction.	Station.	Date.	Velocity.	Direction.
Block Island, R. I.	5	77	nw.	New York, N. Y	6	52	nw.
Do	6	76	nw.	Do	9	68	nw.
Do	9	72	w.	Do	15	52	nw.
Do	10	50	w.	Do	16	52	nw.
Buffalo, N. Y	1	70	w.	Do	19	52	sw.
Do	9	66	w.	North Head, Wash.	8	53	s.
Do	10	52	nw.	Do	11	66	se.
Do	21	50	w.	Do	13	52	s.
Cheyenne, Wyo	9	50	nw.	Do	20	57	se.
Cleveland, Ohio	9	50	sw.	Do	24	72	se.
Columbus, Ohio	4	50	w.	Do	26	74	se.
Detroit, Mich	9	52	w.	Do	27	60	se.
Eastport, Me	9	55	e.	Do	28	52	se.
Do	15	68	ne.	Do	29	60	se.
Hatteras, N. C.	5	50	w.	Pensacola, Fla	8	52	sw.
Do	9	54	nw.	Pittsburgh, Pa	8	52	nw.
Do	13	52	n.	Do	9	56	w.
Mount Tamalpais, Cal	15	50	sw.	Point Reyes Light, Cal	18	50	s.
Do	26	53	w.	Do	24	52	s.
Mount Weather, Va.	1	50	nw.	Do	25	65	s.
Do	4	56	nw.	Portland, Me	6	50	nw.
Do	5	76	nw.	Providence, R. I	9	54	n.
Do	9	84	nw.	Sioux City, Iowa	8	52	nw.
Do	15	59	nw.	Syracuse, N. Y	9	52	nw.
Do	16	66	nw.	Tatoosh Island, Wash	6	64	ne.
Do	19	62	nw.	Do	20	52	s.
Do	23	50	w.	Do	21	52	e.
Do	31	56	nw.	Do	24	50	e.
Nantucket, Mass	9	56	w.	Do	29	60	s.
Do	15	55	se.	Toledo, Ohio	9	56	sw.
New York, N. Y	5	67	nw.				